

WHAT IS CLAIMED IS:

- 1                   1.     A method of dynamically shortening error correction  
2     codewords in an error correction code interleaving arrangement that divides error  
3     correction codewords into segments for recording across a codeword matrix, the  
4     method comprising:  
5                   receiving user data for recording on a storage medium;  
6                   determining the size of the received user data and the amount of  
7     matrix that will be filled by the received user data; and  
8                   recording error correction codewords segments in an interleave  
9     dynamically created to correspond only to the portion of the matrix filled by the user  
10    data.
- 1                   2.     The method of claim 1 wherein the user data is partitioned for  
2     recording onto the recording medium in a plurality of tracks, and each segment of  
3     a codeword is recorded on a separate track.
- 1                   3.     The method of claim 1 wherein the matrix includes a  
2     predetermined number of partitions each dimensioned to hold a predetermined  
3     number of bytes of user data, and determining the amount of matrix that will be  
4     filled comprises determining the number of partitions filled by the user data.
- 1                   4.     The method of claim 3 wherein if the user data does not fill  
2     all the partitions, shortening the codewords to provide an interleave of codeword  
3     segments corresponding to the number of partitions filled by the user data.
- 1                   5.     The method of claim 1 further comprising:  
2                   reading the data from the storage medium;  
3                   determining that the data only fills a portion of the matrix; and  
4                   automatically recreating the error correction codewords as a function  
5     of the dynamically created interleave recorded on the medium.

1                   6.     The method of claim 5 wherein reading the data from the  
2 storage medium comprises determining the shortening value of error codewords  
3 corresponding the partial data fill.

1                   7.     A system for dynamically shortening error correction  
2 codewords used in an error correction code interleaving comprising:

3                   a data buffer for receiving user data, the data buffer including a  
4 processing arrangement for determining the amount of data received in the data  
5 buffer;

6                   an error correction code write buffer connected to the data buffer for  
7 receiving the user data as well as an indication of the amount of data, the write  
8 buffer including a processing arrangement for determining a shortening value for  
9 error correction codewords that correspond to the amount of user data, and  
10 recording the user data and error correction codewords on a recording medium.

1                   8.     The system of claim 7 wherein the write buffer processing  
2 arrangement is further arranged to divide each of the determined number of error  
3 correction codewords into a plurality of segments, and each segment is recorded on  
4 a different track.

1                   9.     The system of claim 7 wherein the write buffer processing  
2 arrangement is further arranged to process the user data into a predetermined  
3 number of partitions each dimensioned to hold a predetermined number of bytes of  
4 user data, and only partitions corresponding to the amount of user data are filled.

1                   10.    The system of claim 7 wherein the write buffer processing  
2 arrangement is further arranged to determine an amount of an error correction  
3 codeword matrix that will be filled by the received user data, the shortening size of  
4 the error correction codewords is determined to correspond only to the portion of  
5 the matrix filled by the user data.

- 1                    11.    The system of claim 7 further comprising:
- 2                    an error correction read buffer having a processing arrangement for
- 3    reading the data from the storage medium, and determining that the data only fills
- 4    a portion of an error correction codeword matrix, wherein the read buffer
- 5    processing arrangement automatically determines the shortening value of the error
- 6    correction codewords corresponding the partial data fill.